

## CLAIMS

1. (previously presented) A method of forming a contact to a source/drain contact region of a transistor device having a gate, and the source/drain contact region is comprised substantially of silicon, the method comprising:

implanting germanium into a region of the source/drain contact region at a dose between  $1E13$  and  $1E17$  atoms per centimeter squared using the gate as a mask;  
activating the germanium implanted into the source/drain contact region;  
implanting boron into the source/drain contact, wherein the implanting the boron is performed subsequent to the activating the germanium; and  
forming a nickel silicide over the source/drain contact region after the activating to form the contact.

2. (previously presented) The method of claim 1 wherein the activating the germanium further includes activating the germanium in order to make the germanium substitutional in a lattice of the source/drain contact region, wherein the lattice includes silicon.

3. (previously presented) The method of claim 1 wherein the activating the germanium increases a lattice constant of the lattice in the source/drain contact region.

4 - 6. (canceled)

7. (original) The method of claim 1 wherein the activating includes heating the source/drain contact region to a temperature of greater than  $550\text{ }^{\circ}\text{C}$ .

8. (currently amended) The A method of claim 1 of forming a contact to a source/drain contact region of a transistor device having a gate, and the source/drain contact region is comprised substantially of silicon, the method comprising:

implanting germanium into a region of the source/drain contact region at a dose between  $1E13$  and  $1E17$  atoms per centimeter squared using the gate as a mask;  
activating the germanium implanted into the source/drain contact region;

implanting boron into the source/drain contact, wherein the implanting the boron is performed subsequent to the activating the germanium; and forming a nickel silicide over the source/drain contact region after the activating to form the contact;

wherein the activating includes heating the source/drain contact region to a temperature of greater than 1000 C.

9. (currently amended) The A method of claim 1 of forming a contact to a source/drain contact region of a transistor device having a gate, and the source/drain contact region is comprised substantially of silicon, the method comprising:

implanting germanium into a region of the source/drain contact region at a dose between

1E13 and 1E17 atoms per centimeter squared using the gate as a mask;

activating the germanium implanted into the source/drain contact region;

implanting boron into the source/drain contact, wherein the implanting the boron is

performed subsequent to the activating the germanium; and

forming a nickel silicide over the source/drain contact region after the activating to form the contact;

wherein the activating further includes heating the source/drain contact region to a temperature in a range of approximately 900 – 1400 C.

10. (original) The method of claim 1 wherein the activating further includes rapid thermal annealing of the source/drain contact region.

11. (original) The method of claim 1 wherein the activating further includes laser annealing of the source/drain contact region.

12. (original) The method of claim 1 wherein the activating further includes arc lamp thermal annealing of the source/drain contact region.

13. (original) The method of claim 1 wherein the activating further includes gas convection annealing of the source/drain contact region.

14. (currently amended) The method of claim 1 wherein the implanting the germanium is performed at a temperature between 25 and 600 degrees Celsius.

15 - 16. (canceled)

17. (previously presented) The method of claim 1 further comprising:  
forming a sidewall spacer adjacent to a sidewall of the gate, wherein the implanting the germanium is performed prior to the forming the sidewall spacer.

18. (original) The method of claim 17 wherein the forming the sidewall spacer is performed prior to the implanting the source/drain dopant.

19. (original) The method of claim 1 wherein the gate is over a semiconductor substrate, the source/drain contact region is in the semiconductor substrate, and the source/drain contact region is disposed laterally from the gate.

20. (original) The method of claim 19 further comprising implanting a second source/drain dopant in the semiconductor substrate after the implanting the source/drain dopant, wherein the second source/drain dopant is implanted deeper than the source/drain dopant.

21. (previously presented) The method of claim 19 wherein the implanting the germanium further includes implanting with an energy of at least 3 keV.

22. (previously presented) The method of claim 19 wherein the implanting the germanium further includes implanting with an energy in the range of 3 keV to 50 keV.

23 - 24. (canceled).

25. (currently amended) The method of claim 19 wherein the implanting the ~~particles~~ germanium is performed at a temperature between 25 and 600 degrees Celsius.

26. (currently amended) The method of claim 1, wherein:  
the transistor has a second source/drain contact;  
the implanting of the further includes implanting the germanium into the second source/drain contact region at the dose between 1E13 and 1E17 atoms per centimeter squared;  
the activating of the germanium further includes activating the germanium implanted into the second source/drain contact region; ~~and~~  
the implanting boron further includes implanting the boron into the second source/drain contact region; and  
~~further comprising~~ forming a second nickel silicide over the second region to form a second contact.
27. (canceled)
28. (original) The method of claim 1, wherein the gate is over a semiconductor substrate and a channel is in the substrate under the gate, further comprising forming a source/drain extension adjacent to the channel in the semiconductor substrate.
29. (canceled)
30. (previously presented) The method of claim 28, wherein the forming comprises implanting a second source/drain dopant into the substrate for forming the source/drain extension, wherein the implanting the second source/drain dopant is performed prior to the implanting the boron.
31. (currently amended) The method of claim 1 further comprising activating the boron.
- 32 - 35. (canceled)
36. (currently amended) A method of forming a semiconductor device, the method comprising:

forming a gate over a silicon substrate, the substrate ~~having a lattice~~ having a lattice constant;  
increasing the lattice constant of the lattice in a source/drain region of the substrate after the forming the gate by implanting germanium at a dose between  $1\text{E}13$  and  $1\text{E}17$  using the gate as a mask;  
implanting a boron into the source/drain region, wherein the implanting the boron is performed subsequent to the increasing the lattice constant; and  
forming a nickel silicide over the portion of the source/drain region.

37 - 43. (canceled)

44. (previously presented) A method of forming a semiconductor device, the method comprising:

forming a gate over a silicon semiconductor substrate;  
implanting particles including germanium into a region of the substrate after the forming the gate at a dose between  $1\text{E}13$  and  $1\text{E}17$  atoms per centimeter squared using the gate as a mask;  
activating the germanium implanted into the region;  
implanting boron into the substrate for forming at least a portion of a source/drain region in the substrate, wherein the implanting the boron is performed subsequent to the activating the germanium; and  
forming a nickel silicide over the region after the activating.

45. (previously presented) In a transistor device structure having a gate stack and source/drain contact regions comprised primarily of a first material, wherein the source/drain contact regions have a lattice constant, a method of forming a contact, comprising:

implanting germanium at a dose between  $1\text{E}13$  and  $1\text{E}17$  atoms per centimeter squared into the source/drain contact regions using the gate stack as a mask;  
activating the germanium implanted into the source/drain contact regions to increase the lattice constant of the source/drain contact regions;  
implanting boron into the source/drain contact regions after the step of activating; and  
forming a nickel silicide over the source/drain contact regions after the step of activating.

46 - 47. (canceled)